

Evaluating the Potential for Local Food Products in Hispanic Markets

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Executive Summary

- **Background:** Arizona is one of the fastest growing states in the nation with its population increasing by nearly 40 percent during the past decade. In Arizona, minorities now account for 36.2 percent of the state's population; persons of Hispanic or Latino origin account for 25.3 percent of the population. Hispanics are often cited as being attractive target markets, as they tend to be brand loyal, particularly with regard to food purchases. However, little is known about the possibilities this market presents for local food products.
- **Objective:** To evaluate the effectiveness of the state brand, the *Arizona Grown* brand, in promoting locally produced products in minority markets, specifically the Hispanic market.
- **Methods:** Using data collected through consumer interviews at various locations of a supermarket chain that caters to Hispanic consumers in the Phoenix metropolitan area, the study evaluated consumer perceptions of products branded as *Arizona Grown* and *Mexico Selected Quality*. The *Mexico Selected Quality* program is in its formative state, but could compete with the Arizona brand. Consumer valuations of these brands were also determined through the use of a conjoint experiment conducted during the interview.
- **Results:** The consumers tended to view food products branded as *Arizona Grown* or *Mexico Selected Quality* as nearly identical in perceived quality. The Arizona product is selected as the most preferred by 51.25% of the sample, while the Mexican product is selected as the most preferred by 43.33% of the sample. Although consumers will pay a premium for a food product branded as *Arizona Grown* or *Mexico Selected Quality*, they view these brands as virtually identical. Consumers also saw no value in information on product origin alone.
- **Implications:** These results offer additional evidence that could be used in supporting proposals to collect licensing fees for use of the *Arizona Grown* brand. This new form of revenue could be used in defending this brand in the event of future competition from *Mexico Selected Quality* products.

TABLE OF CONTENTS

BACKGROUND AND JUSTIFICATION	1
PROCEDURES.....	3
<i>TABLE 1. DEMOGRAPHIC PROFILE BY ZIP CODE.....</i>	<i>6</i>
Figure 1. Phoenix Metropolitan Area Map	7
SURVEY RESPONDENTS.....	8
<i>TABLE 2. SURVEY RESPONDENTS, SUMMARY.</i>	<i>9</i>
Figure 2. Household Income Distribution Across Selected Locations, Sample Vs. US Census.	11
SURVEY ANALYSIS	11
<i>TABLE 3. BRAND LOYALTY, HISPANIC AND NON HISPANIC SHOPPERS.</i>	<i>12</i>
Figure 3. Information on <i>Arizona Grown</i> Program.....	13
Figure 4. Brand Awareness. Arizona Grown Vs. Mexico Selected Quality	14
Figure 5. Origin Preference Distribution	15
<i>TABLE 4. COUNTRY OF ORIGIN RANKING, BY ETHNICITY.....</i>	<i>16</i>
CONJOINT METHOD	17
CONJOINT EXPERIMENT	20
<i>TABLE 5. PRODUCTS PRICE POINTS</i>	<i>21</i>
RESULTS	25
<i>TABLE 6. CONJOINT MODEL ESTIMATES FOR GROCERY PRODUCTS IN HISPANIC MARKETS.</i>	<i>25</i>
SUMMARY AND CONCLUSIONS.....	28
Appendix 1. Survey Questionnaire	31
Appendix 2. Product depiction sample.....	34
Appendix 3. Arizona Grown and Mexico Selected Quality Logos	35
Appendix 4. Consumer's Marginal Willingness to Pay Derivation	36
REFERENCES.....	38

Background and Justification

Arizona is one of the fastest growing states in the nation with its population increasing by nearly 40 percent during the past decade. As in the entire nation, much of this growth in population has been attributable to growth in minorities, notably Hispanics. Nationally, the Hispanic population grew from about 22.4 million or 9 percent of the U.S. population in 1990 to 35.3 million or 12.5 percent in 2000 (U.S. Department of Commerce, 2001a). In Arizona, minorities now account for 36.2 percent of the state's population; persons of Hispanic or Latino origin account for 25.3 percent of the population (U.S. Department of Commerce, 2001b). This rapid growth in population has also been accompanied by growth in income with the Latino middle class growing by more than 80 percent during the past 20 years (Bean *et al.*).

Marketers have long watched the growing Hispanic market with interest. Hispanics are often cited as being attractive target markets, as they tend to be brand loyal, particularly with regard to food purchases (Leah). Latino household expenditures for food consumed at home averaged \$3,503 in 2000, compared to \$2,968 for non-Latino households (U.S. Department of Labor). The difference in expenditures is due in part to higher at-home food expenditures, but it has also been attributed to purchases of higher quality products and branded products (Mulhern and Williams). Despite these favorable market trends for the Hispanic market, little is known about the possibilities Hispanic markets hold for local food processors or producers.

Since 1993, the primary goal of the *Arizona Grown* program has been to increase the consumption of locally grown or processed agricultural products. Past promotional efforts sought to raise the public's awareness of Arizona products and to consequently encourage their consumption. These promotions, however, were not directly targeted towards minority consumers either through the media used or the retail outlets. Thus, a better understanding of the opportunities presented by minority markets for locally produced and branded products is warranted.

Past studies on state branding programs have found that residents of a particular state are often found to prefer products from their home state when they perceive them to be of better quality or succumb to sentimental parochial interests (Patterson *et al.*; Jekanowski *et al.*). A promotion urging consumers to patronize a state's brand is expected to encourage brand loyalty and increase use even if the state's product is not unique and does not command a large market share (Brooker, Eastwood and Orr, 1987). In a study on the *Arizona Grown* program, race or ethnicity were not found to have a significant affect on awareness of this program. However, non-Caucasians were found to be 8.7 percent more likely than Caucasians to express a positive preference for products of Arizona origin (Patterson *et al.*). However, the non-Caucasians made up a fairly small proportion of the sample. Furthermore, they were not directly targeted in the promotion campaign. Still, this limited evidence suggests that efforts targeted at minorities may hold promise.

Hispanics are already the largest minority group in Arizona and are nearly equal in size to African Americans nationally (Hispanic Heritage Awards Foundation). The importance of Hispanic consumers was emphasized recently when the Association of Hispanic Advertisers established an office in the Phoenix metropolitan area (AHAA, 2003). It is projected that the Hispanic population will triple in size by 2050, reaching 24% of the total U.S. population (Strategy Research Corporation). Therefore, it is important to explore the potential market opportunities that exist for local producers of food and agricultural products in targeting Hispanic consumers. This information would prove useful for not only Arizona producers, but also producers in other states experiencing rapid growth in minority populations, especially Hispanics.

The objective of this study is to evaluate the effectiveness of the state brand, the *Arizona Grown* brand, in promoting locally produced products in minority markets, specifically the Hispanic market. It will first determine the level of awareness among targeted minority consumers of the *Arizona Grown* brand and local products and their expressed preferences towards the brand and such branded products. Second, it will determine the influence this brand has on expressed preferences for local products.

Procedures

The objectives of the study were completed through the use of data collected through intercept surveys at a retail chain in the Phoenix metropolitan area,

which caters to Hispanic consumers. Two tasks were performed during these surveys. First, the consumers completed a questionnaire, (see appendix 1), that collected information on the consumer's awareness of the *Arizona Grown* brand and their views towards products branded as such. Second, the consumers were presented depictions of products that were potentially produced in Arizona and possibly labeled as *Arizona Grown*, (see appendix 2). These depictions were part of a conjoint experiment, wherein the price, origin, and brand of the product was systematically varied. When viewing each product depiction, consumers were then asked to indicate their likelihood of purchasing the product.

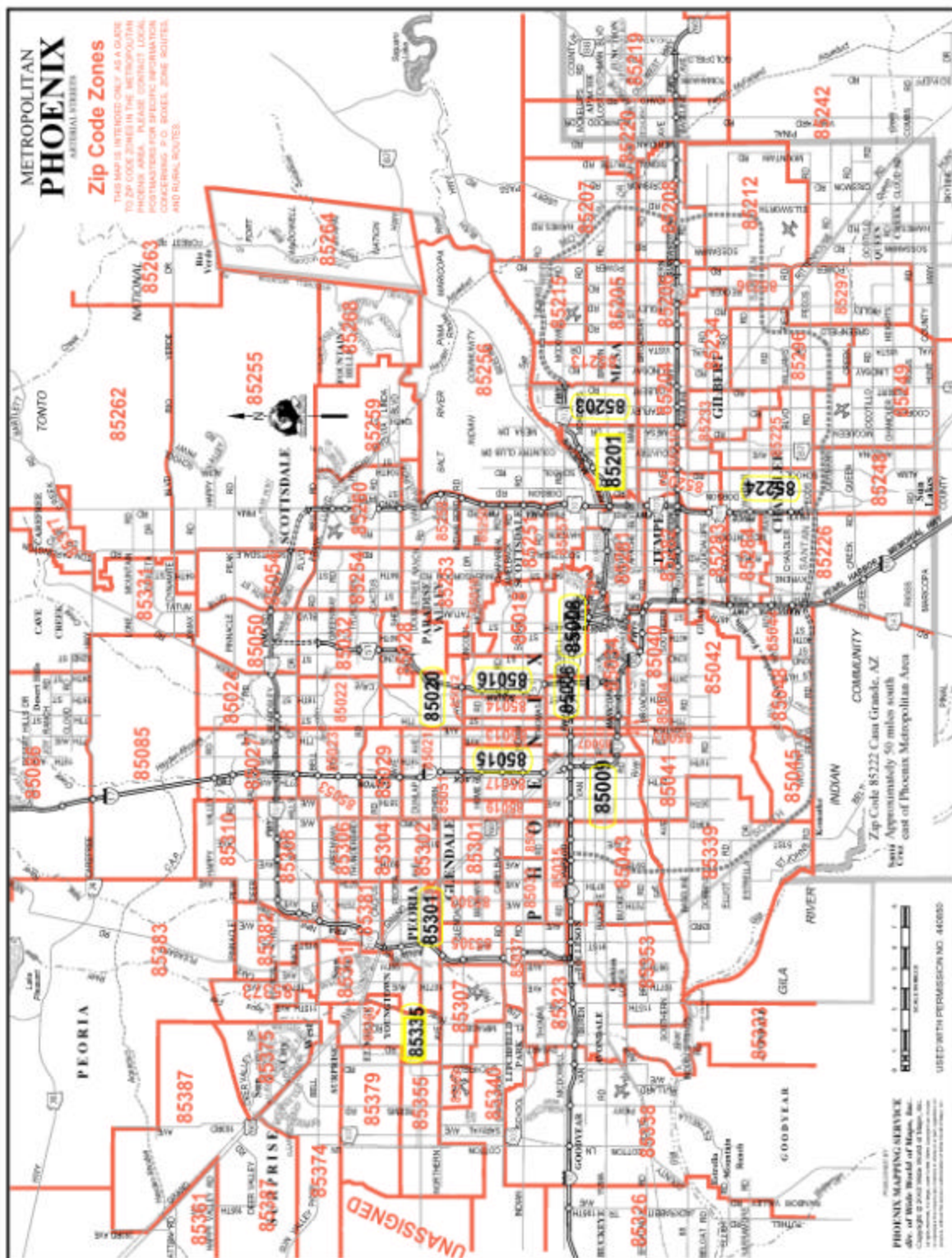
This survey was conducted during the period of October 12 through November 5 of 2003 in five cities in the Phoenix Metropolitan Area (Phoenix, Mesa, Chandler, Glendale and Avondale) and Casa Grande, located approximately 50 miles south east of Phoenix. Eleven store locations within the Phoenix metropolitan area and one in the city of Casa Grande were chosen to get a representative sample of the selected target population. All the surveys were conducted at Food City grocery stores as the customer entered the store. Food City supermarkets cater the Hispanic consumers through its merchandise assortment (meat cuts, spices, imported goods from Hispanic countries, etc.), as well their promotional activities, which target Spanish-speaking customers. This supermarket also pursues a low product price strategy.

The stores selected as survey sites were chosen to achieve a range in consumer income and to provide some geographic diversity across the Phoenix metropolitan area. The demographic profile of each location by zip code is shown in table 1 and a map of all locations is given in page 11. In the city of Phoenix six locations were used for the survey; Mesa had two locations; Chandler, Glendale, Avondale and Casa Grande had one location each. The annual median household income across the selected areas according to the US Census Bureau in the year 2000 averaged \$35,206, and ranged from \$24,934 to \$55,767.

Two female and two male Arizona State University students conducted the surveys. At each location, 30 surveys were conducted. The surveys were conducted as customers entered the store. In an effort to prevent any selection bias, every third person was approached to take the survey. The surveys were conducted in either English or Spanish. Each participant was required to answer the questionnaire and view 36 product cards. The survey respondents were given a \$10 gift certificate to be used in the supermarket at the end of the interview.

Table 1. Demographic Profile by Zip Code.

Subject	85335	85301	85224	85222	85203	85201	85200	85016	85015	85009	85008	85006
	%	%	%	%	%	%	%	%	%	%	%	%
Population	7,676	6,220	4,354	3,785	3,696	5,004	3,472	3,417	4,269	5,604	5,637	3,161
Male	51.3%	50.0%	49.8%	49.5%	49.9%	50.2%	49.8%	50.7%	50.8%	51.2%	52.7%	53.0%
Female	48.7%	50.0%	50.2%	50.5%	50.1%	49.8%	50.2%	49.3%	49.2%	48.8%	47.3%	47.0%
EMPLOYMENT STATUS												
Population 16 years and over	100	100	100	100	100	100	100	100	100	100	100	100
In labor force	68	63.5	75.7	58.1	70.1	69.8	68	66.5	63.2	43.2	59.6	12.3
OCCUPATION												
Management, professional, and related occupations	14.5	18	4.633	39.9	25.5	3.781	32.4	5.889	25.8	6.326	38.4	6.942
Service occupations	28.9	900	18.3	4.691	10.8	2.550	20.7	3.065	14.7	2.668	19	4.660
Sales and office occupations	19.8	615	27.7	7.107	30.3	7.178	23.8	3.532	27	4.903	26.4	6.486
Farming, fishing, and forestry occupations	3.8	117	0.8	20.6	0.4	102	2.3	342	0.3	62	0.2	48
Construction, extraction, and maintenance occupations	17.5	546	17	4.354	8.2	1.943	11	1.627	12.7	2.305	13.5	3.304
Production, transportation, and material moving occupations	15.5	484	18.2	4.682	10.4	2.460	16.6	2.464	12.8	2.322	15.2	3.736
INCOME IN 1999												
Average Household Size	3.59	2.86	2.74	2.83	2.9	2.56	2.25	2.16	2.73	3.84	3.02	3.46
Households	100	2,043	100	15,711	100	12,742	100	15,327	100	16,714	100	8,919
Less than \$10,000	10.1	209	13.4	2.893	3.7	578	11.2	1.480	5.6	709	9.7	1.851
\$10,000 to \$14,999	4.7	97	9.5	2.053	3.2	497	7.1	935	4.9	618	7.1	1.346
\$15,000 to \$24,999	16	331	19.8	4.282	7.5	1,178	15.8	2.097	13.6	1,734	14.2	2,702
\$25,000 to \$34,999	21.4	442	17.1	3.701	11.2	1,765	16.6	2,198	13	1,652	17.9	3,414
\$35,000 to \$49,999	25.2	520	18.1	3,921	16.1	2,536	18.3	2,422	17.1	2,179	21.7	4,126
\$50,000 to \$74,999	15.6	322	15.4	3,321	27.6	4,331	17.7	2,347	21.1	2,686	18.3	3,487
\$75,000 to \$99,999	4	83	4.7	1,017	15.6	2,445	7	922	12.3	1,570	6.2	1,186
\$100,000 to \$149,999	2.2	45	1.4	313	11.9	1,862	4.5	593	8.7	1,108	4	756
\$150,000 to \$199,999	0.5	10	0.4	76	2.1	334	1.3	167	2.4	306	0.7	137
\$200,000 or more	0.2	4	0.2	52	1.2	185	0.6	76	1.4	180	0.2	40
Median household income (dollars)	(X)	33,813	(X)	29,039	(X)	55,767	(X)	34,510	(X)	46,256	(X)	35,576
Per capita income (dollars)	(X)	10,342	(X)	12,266	(X)	15,294	(X)	18,851	(X)	26,582	(X)	27,549
Median earnings (dollars):												
Male full-time, year-round workers	(X)	25,176	(X)	25,782	(X)	44,592	(X)	32,393	(X)	37,458	(X)	35,268
Female full-time, year-round workers	(X)	19,192	(X)	22,256	(X)	31,139	(X)	22,262	(X)	27,132	(X)	30,338
Hispanic or Latino												
Hispanic or Latino (of any race)	66.8	5,131	45.8	28,469	15.1	6,566	38.1	14,435	18.5	6,837	29.6	14,826
Not Hispanic or Latino	33.2	2,545	54.2	33,732	84.9	36,978	61.9	23,419	81.5	30,159	70.4	35,188



Survey Respondents

Most of the survey respondents were women (64%). However, this is to be expected, where women continue to be the primary food shopper in most households (Food Institute). The survey locations proved to be very effective in reaching Hispanic consumers, as 81% of the sample is composed of individuals who identified themselves as being of Hispanic background. Approximately 93% of the sample reported to be a resident of the state of Arizona. Nearly 57%, though, reported to have previously lived in Mexico. About 28% of the respondents claimed the United States as their country of origin. Other countries of origin in the sample include Argentina, Chile, Colombia, Cuba, Guatemala, Honduras, Puerto Rico, and Venezuela.

The level of educational attainment in the sample varied from some high school or less (43%) to some college or technical school (13%) or college graduate (13%). Similarly, household income varied from less than \$10,000 (20%) to \$75,000 or more (2%). The majority of the sample (58%), though, had a total household income in the \$10,000 to \$40,000 range.

These income levels are compared to those reported by the U.S. Census for these same areas, as illustrated in figure 1. In comparison, the sample draws a little more heavily for the lower end of the income distribution. This is likely due to the target market of Food City. In addition to targeting Hispanic consumers, Food City also tends target value conscious consumers. So while it provides an excellent site to intercept Hispanic shoppers, it is acknowledged that many of

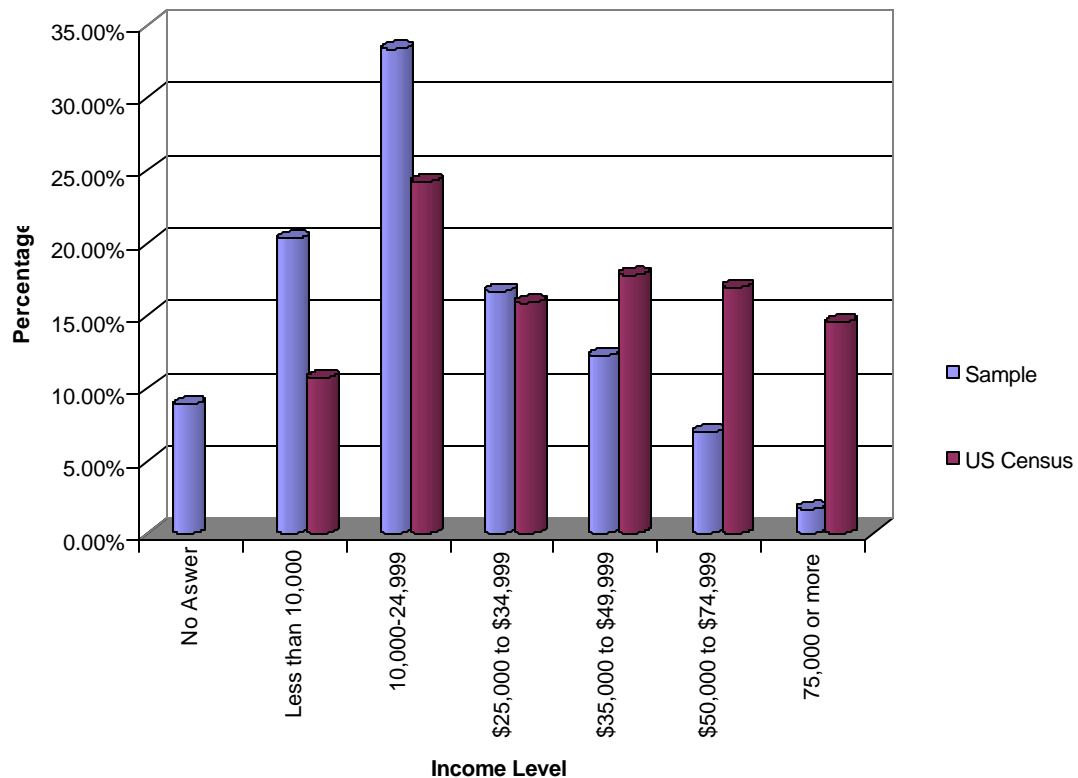
these shoppers tend to be from lower income households. However, it should also be recognized that the zip code region used to collect the Census data encompasses a large geographic region, which will tend to include a greater diversity of income levels, when compared to a sample of shoppers at Food City.

Table 2. Survey Respondents, Summary.

		Number	Percent
Gender			
	Male	127	35.28%
	Female	232	64.44%
	Not answer	1	0.28%
	Total	360	
Ethnicity			
	White, Not Hispanic	41	11.39%
	African American	16	4.44%
	Asian American	1	0.28%
	Native American	8	2.22%
	Hispanic	291	80.83%
	Not answer	3	0.83%
	Total	360	100.00%
Residency Status			
	Visitor	25	6.94%
	Resident	335	93.06%
	Total	360	100.00%
Country of Origin			
	Argentina	1	0.28%
	Canada	1	0.28%
	Chile	1	0.28%
	Colombia	1	0.28%
	Cuba	4	1.11%
	Guatemala	3	0.83%
	Honduras	1	0.28%
	Mexico	205	56.94%
	Puerto Rico	3	0.83%
	Russia	1	0.28%
	USA	102	28.33%

	Number	Percent
Venezuela	4	1.11%
Not answer	33	9.17%
Total	360	100.00%
Educational Achievement		
High school graduate	107	29.72%
Some High School or less	155	43.06%
College graduate	47	13.06%
Some College or technical School	48	13.33%
Not answer	3	0.83%
Total	360	100.00%
Household Size		
# Adults	2.82	
# Children	1.86	
Age		
18-25	68	18.89%
26-35	137	38.06%
36-45	89	24.72%
46-65	57	15.83%
66 or Older	8	2.22%
Not answer	1	0.28%
Total	360	100.00%
Income		
Less than 10,000	73	20.28%
10,000-24,999	120	33.33%
25,000-39,999	90	25.00%
40,000-59,999	28	7.78%
60,000-74,999	11	3.06%
75,000 or more	6	1.67%
Not answer	32	8.89%
Total	360	100.00%

Figure 2. Household Income Distribution Across Selected Locations, Sample Vs. US Census.



Survey Analysis

Most promotions on *Arizona Grown* products have focused primarily on fruits and vegetables. Among the shoppers in the sample, it was found that they are frequent produce buyers with up to 81% buying these products once a week. Importantly, among the weekly produce buyers, 87% are Hispanic. Furthermore, among the Hispanic shoppers, 32.8% revealed that that they tend to always buy the same brand, compared with 24.24% for non-Hispanics. This offers some corroborating evidence for the assertion that Hispanic shoppers tend to be brand loyal.

Table 3. Brand Loyalty, Hispanic and Non Hispanic Shoppers.

Criteria	Hispanic		Non-Hispanic		Total	
	Number	%*	Number	%*	Number	%**
Always buy the same brand	96	32.88%	16	24.24%	112	31.28%
Usually buy the same brand	78	26.71%	28	42.42%	106	29.61%
Sometimes buy the same brand	65	22.26%	11	16.67%	76	21.23%
Rarely buy the same brand	19	6.51%	7	10.61%	26	7.26%
Never buy the same brand	34	11.64%	4	6.06%	38	10.61%

* Calculated within group, ** calculated based on total sample

Hispanics are conservative in their lifestyles, which results in higher levels of brand loyalty than non-Hispanics. Some reasons for brand loyalty include family dynamics, taste-perceptions, consistent quality, risk adversity, tradition and familiarity. Fifty-five percent of Hispanics believe brand names are superior to store brands (Hispanic Heritage Award Foundation). According to the Hispanics Opinion Tracker study by People en Español, Hispanics exhibit impressive brand loyalty: 52% of those polled claim they are loyal to a particular brand and 39% said they look for quality in a product before checking its price. One-third regard shopping as relaxing, compared to just 8% of the general consumer population. According to the study findings, Hispanics are very aspirational, and shopping for brands correlates strongly with externally-motivated behavior (Hispanic Marketing & Communication Association).

However, the shoppers in this sample were not particularly familiar with the *Arizona Grown* brand with only 33% indicating an awareness of this program. This compares to awareness levels of 23.3% measured by Patterson, et al (1999) in 1997. So, the level of awareness among the current sample of predominantly

Hispanic shoppers is higher than awareness levels in a broader market. This may be attributable to the long time the brand has had a presence in the market, especially since 1997. Among the Food City shoppers that do recognize the *Arizona Grown* program, 61% said that they learned about the program through in-store display material.

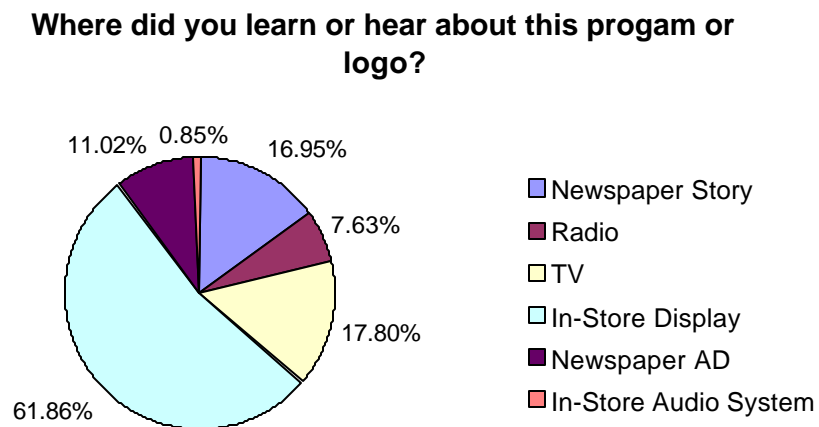
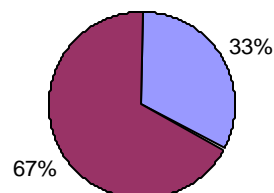


Figure 3. Information on *Arizona Grown* Program

The *Arizona Grown* brand is potentially not the only origin brand in this market. In September 2001, the Mexican Government announced that it will launch a *Mexico Selected Quality* branding program. This program was designed by the Mexican government to enhance the perception of products exported from Mexico. Although the program began with the brand *Mexico Selected Quality*, the one used in the study, it has since been changed to *Mexico Supreme Quality*. Today 12 products have been certified to be marketed under the *Mexico Supreme Quality* brand: coffee, bananas, lime,

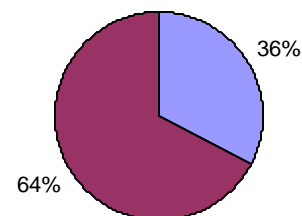
breadfruit, rice, peppers, mango, grapes, avocados, honey, hog meat and beef. Certification requires adherence to certain quality standards, including food safety standards. However, to date, there have been no significant promotion of the program, nor any products shipped under this brand logo to the US. Still, given the shifts in U.S. demographics with a larger Hispanic population that is composed of a large number of Mexican immigrants, the *Mexican Supreme* program could serve as a significant rival to U.S. based branding programs, particularly for products from U.S. border states with growing seasons that overlap with those in Mexico. Surprisingly, about 36% of the sample indicated an awareness of the *Mexico Selected Quality* program, nearly equal to those expressing an awareness of *Arizona Grown*.

Are you familiar with the Arizona Grown program or the Arizona Grown logo?



■ Yes ■ No

Are you familiar with the Mexico Selected Quality program or the Mexico Selected logo?



■ Yes ■ No

Figure 4. Brand Awareness. Arizona Grown Vs. Mexico Selected Quality

In addition to having nearly equal levels of awareness, the *Arizona Grown* and *Mexico Selected Quality* programs were also viewed nearly equally by the respondents. When asked if a product branded as *Arizona Grown* is superior in quality, 39% strongly agreed and 45% agreed. When asked if a product branded as *Mexico Selected Quality* is superior in quality, 41% strongly agreed and 40% agreed.

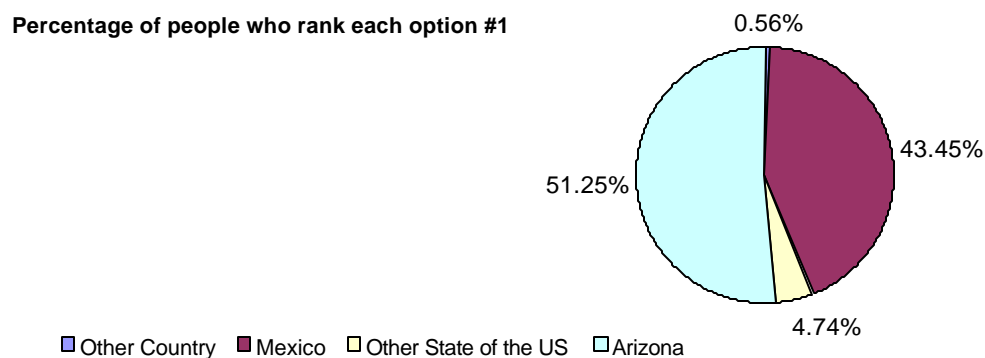


Figure 5. Origin Preference Distribution

The last survey question asked, "If given a choice on similar food products at similar price and quality from Mexico, Arizona, another state from the US or other country. Which one would you purchase? Rank them in order of preference". Overall, Arizona origin products edged out Mexican origin products, but by a small margin. Arizona was the most preferred origin by 51.25% of the sample; Mexico was the most preferred origin by 43.45% of the sample. Among those that ranked Arizona as their first choice 44% are non-Hispanic and 40% are Hispanics from Mexico, that on average have been in the

U.S. more than ten years. On the other hand, among those who ranked Mexico as their first choice, 93% are Hispanic and 81% are from Mexico. This provides some preliminary evidence that an individual's country of origin and tenure in the U.S. can temper their views on products from different origins.

Table 4. Country of Origin Ranking, by Ethnicity

Criteria	Hispanic		Non-Hispanic		Total	
	Number	%*	Number	%*	Number	%**
Ranked As First Choice						
Arizona	133	45.24%	51	78.46%	184	51.25%
Mexico	151	51.36%	5	7.69%	156	43.45%
Other State of the US	8	2.72%	9	13.85%	17	4.74%
Other Country	2	0.68%	0	0.00%	2	0.56%
Arizona Grown Superior in Quality						
Strongly Agree	112	39.72%	25	28.74%	137	39.48%
Agree	131	46.45%	26	29.89%	157	45.24%
Neither Agree or Disagree	33	11.70%	11	12.64%	44	12.68%
Disagree	5	1.77%	3	3.45%	8	2.31%
Strongly Disagree	1	0.35%	0	0.00%	1	0.29%
Mexico Selected Quality Superior in Quality						
Strongly Agree	122	42.66%	22	34.92%	144	41.26%
Agree	119	41.61%	22	34.92%	141	40.40%
Neither Agree or Disagree	34	11.89%	16	25.40%	50	14.33%
Disagree	8	2.80%	3	4.76%	11	3.15%
Strongly Disagree	3	1.05%	0	0.00%	3	0.86%

* Calculated within group, ** calculated based on total sample

Conjoint Method

After responding to questions on their awareness of the *Arizona Grown* brand and their preferences towards products branded as such, the survey respondents were presented with cards depicting products from Arizona as part of a conjoint analysis.

Conjoint analysis is a multivariate technique used specifically to understand how consumers develop preferences for products or services. It is based on the premise that consumers evaluate the value of a product/service/idea by combining the separate amounts of value provided by each attribute. Utility, which is the conceptual basis for measuring value in a conjoint analysis, is a subjective judgment of preference unique to each individual (Hair, Anderson, Tatham & Black). In conjoint analysis, the stimuli represent some predetermined combination of attributes and respondents are asked to make judgments about their preference for these various attribute combinations. The basic aim is to determine the combination of features consumers most prefer (Churchill).

Conjoint analysis is used extensively in marketing research and industrial applications, notably for analyses on new product development, market segmentation, or product differentiation (Green). By 1982, it was estimated that there had been over 1,000 industrial applications of conjoint analysis (Cattin and Wittink). Economists recognized that this stated preference methodology could

be used as an alternative to traditional open-ended contingent valuation methods (CVMs), where respondents are directly asked to place a value on a particular product attribute, or closed-ended CVMs, where respondents are asked whether they would pay a specified amount for a particular attribute (MacKenzie). In conjoint experiments, price is included as one of the product attributes. The ratings or rankings elicited from the survey respondents are used to form an indirect utility index. By regressing this index value (ratings or rankings) on the corresponding product attributes, estimates of the consumer's marginal utility for the attributes are obtained directly from the regression model coefficients. The ratio of two marginal utility values provides a measure of the consumer's marginal rate of substitution for the two product attributes. The negative of the ratio of the coefficient for an attribute and the price coefficient is a compensated measure of the consumer's marginal willingness to pay or the implicit price for the attribute ($-b_i/b_p$). Appendix 5 provides a complete derivation of this measure.

Estimates of the implicit price for product attributes for non-market and market goods have been developed using conjoint analysis. For example, Mackenzie evaluates the implicit price (or marginal valuation) of various attributes of a deer hunting trip. In this non-market good application, the estimated cost of the trip is a measure of the trip's price. Some of the attributes evaluated include hunting with friends, the amount of congestion at the hunting site, and the probability of bagging a deer. This methodological approach has

gained acceptance in the resource economics literature and can be extended to hypothetical market goods, as demonstrated by studies in the health economics literature (see San Miguel, Ryan, and McIntosh; Ryan and Hughes, among others). For example, patients with colorectal cancer have indicated their willingness to pay for a new branded chemotherapy treatment (Aristides, et. al.). The estimated implicit prices provide an intuitive measure of consumer valuations of product attributes, which are analogous to the shadow prices derived through hedonic price model estimation. Furthermore, the implicit prices provide more information to managers than the measures associated with traditional conjoint analysis, where only the relative importance of various product attributes may be reported on a scale of 0 to 100.

It is argued that one of the major advantages of conjoint analysis, in comparison to contingent valuation methods, is the high degree of realism with which consumer choices may be portrayed (Hausman). The method also allows for a richer analysis of more product attributes. Survey respondents appear to be more comfortable responding to survey questions where price is treated as another attribute of a composite good, rather than having to directly place a value on a certain attribute or accept a single attribute at a specified price, as in CVMs (MacKenzie). This makes conjoint analysis a more attractive research method. However, some respondents could have a tendency to underweight the price variable, "since they do not have to actually pay the price," leading to an upward bias in the implicit price estimates (Goett and Hudson, p. 13).

Thus, as with any research results, estimated implicit prices should be evaluated against the manager's and researcher's experience and intuition.

Conjoint analysis could prove to be a useful evaluation and planning tool for managers of state branding programs. It provides a relatively low cost, expedient method for testing elements of the branding program. Indeed, the lack of experience with a state brand in some states and the absence of relevant time series or cross sectional data may make experimental methods, like conjoint analysis, the only way to evaluate such programs. Furthermore, funding constraints in some states may make analyses using data collected through a market experiment or from commercial data vendors infeasible. Finally, the ability to compute an implicit price associated with the brand is helpful for the managers in their discussions with policymakers and potential industry partners. The experiment also allows for the analysis of several program features, such as the design of the program logo or slogan.

Conjoint Experiment

The products used in this conjoint experiment were tomatoes, grapes, cantaloupe and cilantro. These products have economic importance for Arizona produce growers and are important Mexican exports to the Arizona market. They are also products consumed traditionally in the Hispanic diet. For each product, four characteristics were varied in the experiment: the presence of the *Arizona Grown* or the *Mexican Selected Quality* program logo in English or

Spanish, country of origin information (“Product of Mexico”), and price. (See appendix 3 for example product depictions). The origin brands were either present or not and obviously would not appear simultaneously. Similarly, the country of origin information was either present or not. Three price points were used for each product (“high”, “medium” and “low”), based on actual price strategies used by Food City Supermarket. The selected prices are shown in table 5.

Table 5. Products Price Points

Product	Low	Medium	High
Cantaloupe	\$0.25/lb	\$0.33/lb	\$0.50/lb
Cilantro	4 for \$0.99	3 for \$0.99	2 for \$0.99
Grapes	\$0.99/lb	\$1.49/lb	\$1.99/lb
Tomatoes	\$0.49/lb	\$0.89/lb	\$0.99/lb

Using all possible characteristic arrangements would result in 30 combinations for each product. This is equivalent to a 5x2x3 experiment (5 logos, 2 country of origin levels, and 3 price points). If each respondent were shown all 30 cards for each product, they would be required to view 120 cards. Such a large number of product combinations is far too many to be successfully used during an interview. For this experiment it was decided to first reduce the number of cards from 30 to 18 combinations for each product. Second, each respondent was then only shown cards for two products. The products shown to the respondents at each location were developed through a randomized

design, which specified the product combination before the interviews. Furthermore, the order of the product cards was randomly arranged before each interview to avoid any bias that could arise due to card sequence.

Typically, the number of product depictions or cards that a respondent is shown may be reduced by developing a fractional-factorial design, which is a subset of the full-factorial design, where all the information needed for determining the marginal valuations of certain attributes is preserved. Assuming a linear additive model of product attributes, an orthogonal experimental design can be developed, whereby the subset of factor levels is orthogonal and balanced. Each level in a factor appears the same number of times and there is no collinearity among the variables in the design matrix or the matrix of independent variables, resulting in efficient parameter estimates (Hair *et al*).

For the current experiment, there were some attributes that logically would not appear together. Specifically, a product labeled as *Mexico Quality Selected* would not appear without a country of origin label ("Product of Mexico"). Similarly, a product labeled as *Arizona Grown*, would not appear with a "Product of Mexico" label. These restrictions prohibited the development of an orthogonal design. Using the experimental design tool in the SAS® statistical software package, a nearly orthogonal design was developed using the D-efficiency design criteria, allowing the number of profiles to be reduced to 18

(SAS® Institute).¹ This criteria finds the subset of attribute combinations such that the design matrix variables exhibit a minimum amount of collinearity making it nearly orthogonal (Kuhfeld, Tobias, and Garratt).

The survey respondents were presented with cards containing depictions of the products (appendix 2). All the cards had a 10-point purchase likelihood scale printed on them (1=extremely unlikely, 10=extremely likely). The respondents were asked to respond to the card using this rating scale, which becomes the dependent variable (r_{ij}) in the conjoint model:

$$r_{ij} = \mathbf{b}_0 + \mathbf{b}_1 AZ_{GrownSpa} + \mathbf{b}_2 AZ_{GrownEn} + \mathbf{b}_3 MX_{SelQualSpa} + \mathbf{b}_4 MX_{SelQualEn} + \mathbf{b}_5 COO + \mathbf{b}_6 Price + e_1$$

Where:

- ◇ r_{ij} = rating assigned to the i^{th} profile for product j
- ◇ \mathbf{b}_0 = constant.
- ◇ $AZ_{GrownSpa}$ = Arizona Grown logo, Spanish version.
- ◇ $AZ_{GrownEn}$ = Arizona Grown logo, English version.
- ◇ $MX_{SelQualSpa}$ = Mexico Selected Quality logo, Spanish version.
- ◇ $MX_{SelQualEn}$ = Mexico Selected Quality logo, English version.
- ◇ COO = Country of Origin information ("Product of Mexico").
- ◇ $Price$ = Price variable; three points used; low, medium, and high.
- ◇ e_1 = Standard error.

¹ Measures on the efficiency of a design matrix \mathbf{X} are based on the inverse of the information matrix, $(\mathbf{X}'\mathbf{X})^{-1}$. The variance-covariance matrix of parameter estimates \mathbf{b} is proportional to $(\mathbf{X}'\mathbf{X})^{-1}$. An efficient design will have a relatively small variance matrix and the eigenvalues of $(\mathbf{X}'\mathbf{X})^{-1}$ provide a measure of the "size" of the variance matrix. The D-efficiency measure is a function of the geometric mean of the eigenvalues of the inverse of the information matrix (Kuhfeld, Tobias, and Garratt).

The variables $AZ_{GrownSpa}$, $AZ_{GrownEn}$, $MX_{SelQualSpa}$, $MX_{SelQualEn}$, and COO are 0-1 binary variables (dummy variables), which are equal to one, when the attribute is present in the product depiction.

The model was estimated by ordinary least squares using the data from all survey respondents in a pooled sample. The implicit prices were evaluated using a Wald test under the null hypothesis that the ratio of the attribute coefficient and the price coefficient equals zero.

Results

For this experiment each product is evaluated individually model using the model described above. The parameter estimates for each model are given in table 6, along with the estimated implicit prices. The coefficient of determination (R^2) is relatively low for each model. However, this is frequently found using cross-sectional data. More importantly, the null hypothesis that all independent variables equals zero (F-value) is rejected in each case. This provides some confidence on the ability of the model to explain consumer preferences for these products with these various attributes. Finally, nearly all the estimated parameters in each model are significantly different from zero and have the expected sign. For each model, we will use the estimated implicit prices to assess consumer's preferences for these product attributes.

Table 6. Conjoint Model Estimates for Grocery Products in Hispanic Markets.				
Product Model	Implicit Price			
Variable	Coefficient	t-ratio	Estimate	t-ratio
Cantaloupe				
Constant	9.074**	35.008		
Az. Grown – English	0.911**	4.826	0.134**	4.305
Az. Grown – Spanish	0.851**	4.506	0.125**	4.056
Mex. Sel. – English	0.803**	3.524	0.118**	3.554
Mex. Sel. – Spanish	0.786**	3.450	0.116**	3.481
Origin (Mexico)	-0.013	-0.058	-0.002	-0.058
Price	-6.795**	-11.761		
Az. Eng - Mex.Eng.			0.016	0.358
N	3,186			
R^2	0.05			
F-Value	32.67			

Table 6. Conjoint Model Estimates for Grocery Products in Hispanic Markets.

Product Model			Implicit Price	
Variable	Coefficient	t-ratio	Estimate	t-ratio
Cilantro				
Constant	9.771**	45.448		
Az. Grown – English	0.811**	5.181	0.099**	4.817
Az. Grown – Spanish	0.771**	4.927	0.094**	4.605
Mex. Sel. – English	0.571**	3.021	0.070**	3.070
Mex. Sel. – Spanish	0.756**	3.997	0.092**	4.054
Origin (Mexico)	0.075	0.410	0.009	0.407
Price	-8.199**	-17.106		
Az. Eng - Mex.Eng.			0.029	-0.956
N	3167			
R ²	0.056			
F-Value	62.506			
Grapes				
Constant	9.412**	36.561		
Az. Grown – English	0.832**	4.571	0.337**	4.321
Az. Grown – Spanish	1.084**	5.952	0.438**	5.475
Mex. Sel. – English	0.765**	3.485	0.309**	3.529
Mex. Sel. – Spanish	0.833**	3.798	0.337**	3.842
Origin (Mexico)	0.043	0.201	0.017	0.200
Price	-2.473**	-17.480		
Az. Eng - Mex.Eng.			0.027	-0.234
N	3150			
R ²	0.1094			
F-Value	64.349			
Tomatoes				
Constant	8.802**	35.107		
Az. Grown – English	0.898**	4.950	0.317**	4.378
Az. Grown – Spanish	1.132**	6.239	0.400**	5.236
Mex. Sel. – English	0.733**	3.367	0.259**	3.330
Mex. Sel. – Spanish	0.717**	3.296	0.254**	3.264
Origin (Mexico)	0.188	0.900	0.066**	0.883
Price	-2.830**	-10.756		
Az. Eng - Mex.Eng.			0.058	-.574
N	3112			
R ²	.056			
F-Value	30.737			

Two (**) and one (*) asterisks denote significance at the five and ten percent levels, respectively.

Starting with the cantaloupe model, it is found that a product labeled as *Arizona Grown* using the English version of this label could sell at a premium of about \$0.13, compared to a product with no label, holding all other factors constant. Similarly, a product labeled with the Spanish version of the *Arizona Grown* label, would also sell at a premium of \$0.13. Products labeled as *Mexico Selected Quality*, whether in English or Spanish, would sell at a \$0.12 premium. When compared to the median price for this product (\$0.33/lb), these results suggest premiums of about 41% and 36% for the Arizona and Mexican brands, respectively. These results also show that consumers readily accept either the English or Spanish versions of these branding program labels. Furthermore, they value the brands in nearly the same way. Indeed, we could not reject the null hypothesis that the difference in the premiums for the *Arizona Grown* and *Mexico Selected Quality* brands (English versions) is equal to zero. So, while consumers value the *Arizona Grown* and the *Mexico Selected Quality* brands, they value them nearly identically. Furthermore, information on origin, being of Mexican origin specifically, is not particularly important to these consumers. Although the coefficient on origin (Mexico) and the estimated implicit price are negative, they are not significantly different from zero.

This similar pattern of results was found for the other products, as well. Branded Arizona or Mexican products could sell at a premium, but their premiums are nearly identical, while information on origin alone is of little value. The only differences in the result are in the magnitude of the premiums for each

product. However, relative to the product's median price, these premiums range between 21 to 36 percent.

In the cilantro case it was found that the *Arizona Grown* brand has a premium of \$0.10 and the *Mexico Quality Selected* brand has a \$0.07 to \$.08 premium. Again, the premiums for the English version of these competing brands were not significantly different. For grapes, the *Arizona Grown* premium was \$0.34 and \$0.44 for the English and Spanish labels, respectively. Meanwhile, the *Mexico Quality Selected* grapes had premiums of \$0.31 to \$0.34 (English or Spanish). For tomatoes, the *Arizona Grown* premiums ranged between \$0.32 and \$0.40 (English and Spanish), while the *Mexico Selected Quality* premiums ranged between \$0.26 and \$0.25 (English and Spanish).

Summary and Conclusions

This study provides new evidence on the effectiveness of origin branding programs when targeted at Hispanic consumers. It also provides some new evidence on the food shopping behavior of these consumers. These results were obtained through interviews of consumers in the Phoenix metropolitan area. During the interview, a traditional attitude and use survey was conducted, along with a conjoint experiment, where consumer responses to the origin branding programs sponsored by the state Arizona and the Mexican government were recorded.

The results showed that the consumers, which were predominantly of Hispanic origin and from the country of Mexico, tended to view food products branded as Arizona Grown or Mexico Selected Quality as nearly identical in perceived quality. Furthermore, if given a choice between a food product from Arizona, Mexico, or other states or countries, the Arizona product was selected as the most preferred by 51.25% of the sample, while the Mexican product was selected as the most preferred by 43.33% of the sample. Thus, the Arizona product is only most preferred by a slightly higher share of the sample. It was also revealed that the tendency to favor the Arizona product was more dominant among Mexican immigrants who have lived in the United States for more than 10 years. So, length of residency tends to have an affect on preferences with respect to product origin.

Next, experiments were conducted to determine the premium consumers would be willing to pay for food products branded as Arizona Grown or Mexico Selected Quality. Consistently, across all four products, cantaloupe, cilantro, grapes, and tomatoes, the premiums offered for these competing brands were statistically significant and in the range of 21% to 41%. However, when the competing brand premiums were compared to one another on a product-by-product basis, they were significantly different from one another. So while consumers will pay a premium for a food product branded as Arizona Grown or Mexico Selected Quality, they view these brands as virtually identical.

Also, these consumers saw no value in information on product origin alone. Although there was a slight discount for products from Mexico, the discount was not statistically significant. So, future information on country of origin, as required under recent legislation, will not affect product sales and will be of no real value to the consumers in this sample.

These findings suggest some impending challenges for the Arizona Grown program. Recall, only 33% of the sample mentioned awareness on the Arizona brand. If the Mexican government launches an aggressive promotion campaign in the U.S., this could result in a more advantageous position for the Mexican products, particularly among Hispanic consumers. At the same time, the findings show that consumers do value the Arizona brand. This offers additional evidence that could be used in supporting proposals to collect licensing fees for the use of the Arizona Grown brand. This new form of revenue could be used in defending this brand.

Appendix 1. Survey Questionnaire

Grocery Shopper Survey

Scope and Purpose

This survey is being conducted to gather information on consumer grocery shopping behavior. It is part of a research project being conducted at Arizona State University by Dr. Paul Patterson. This survey should take you only about five minutes to complete. Your participation would be very helpful, but it is completely voluntary. Your refusal to participate will have no consequences for you. The information you provide on this survey cannot be traced back to you. The results from this study will assist Arizona farmers, food retailers, and state agencies in developing information services for Arizona consumers. If you have any questions, please contact Dr. Paul Patterson at 480-727-1124.

Food Shopping Behavior

1. How often do you purchase fresh fruits or vegetables? (Please select one item):

☐ Once a Week ☐ Twice a Month ☐ Once a Month ☐ NEVER

2. In general, when purchasing food products which of the following best describes your behavior?

(Please check **ONE** item):

- ☐ ALWAYS purchase the same brand
☐ USUALLY purchase the same brand
☐ SOMETIMES purchase the same brand
☐ RARELY purchase the same brand
☐ NEVER purchase the same brand

3. Are you familiar with the Arizona Grown program or the Arizona Grown logo?

☐ YES ☐ NO



If yes, where did you learn or hear about this program or logo?

(Please check all that apply):

- ☐ NEWSPAPER STORY ☐ RADIO NEWS STORY
☐ TELEVISION NEWS STORY ☐ IN-STORE DISPLAY MATERIAL
☐ NEWSPAPER ADVERTISEMENT ☐ IN-STORE AUDIO SYSTEM

4. If a product is marked as being grown or produced in Arizona, would you expect this product to be:

(Please circle **ONE** response for each product attribute):

Arizona Product Attribute	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
SUPERIOR IN QUALITY	1	2	3	4	5

5. Are you familiar with the Mexico Quality Selected program or the Mexico select logo?

☐ YES ☐ NO



6. If a product is marked Mexico Selected Quality, would you expect this product to be: (Please circle **ONE** response for each product attribute):

<i>Arizona Product Attribute</i>	<i>Strongly Agree</i>	<i>Agree</i>	<i>Neither Agree or Disagree</i>	<i>Disagree</i>	<i>Strongly Disagree</i>
SUPERIOR IN QUALITY	1	2	3	4	5

7. If given a choice on similar food products at similar price and quality from Mexico, Arizona, another state or other country. Which one would you purchase? Rank them in order of preference being 1 the most prefer

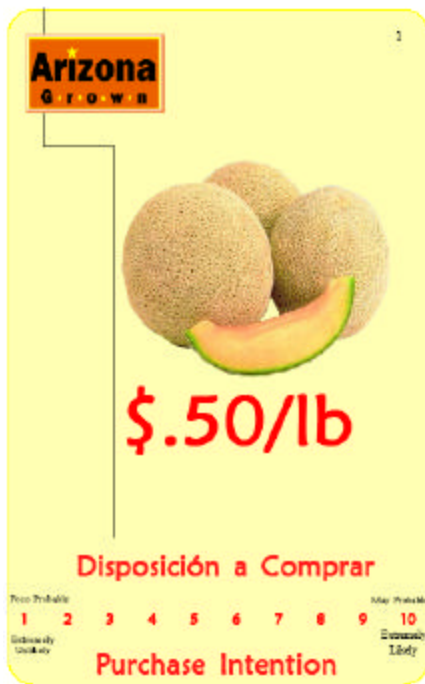
____Other Country ____MEXICO ____Other State of the US ____Arizona

Please tell us about yourself

Finally, we need to ask some questions necessary for our research about you and your household. Note, this information cannot be traced back to you.

8. Gender: ☐ **MALE** ☐ **FEMALE**
9. Ethnic background:
☐ **WHITE, NOT HISPANIC** ☐ **AFRICAN AMERICAN** ☐ **ASIAN AMERICAN**
☐ **NATIVE AMERICAN** ☐ **HISPANIC**
10. What best describes your residency status? (*Please check **ONE** category*):
☐ **VISITOR**
☐ **CURRENT OR NEW RESIDENT**
HOW MANY YEARS IN US _____
HOW MANY YEARS IN ARIZONA _____
Country of Origin _____
11. How many adults live in your household ?_____
12. How many children live in your household? _____
13. What is your highest level of educational achievement? (*Please check **ONE** category*):
☐ **HIGH SCHOOL GRADUATE** ☐ **SOME HIGH SCHOOL OR LESS**
☐ **COLLEGE GRADUATE** ☐ **SOME COLLEGE OR TECHNICAL SCHOOL**
14. What is your age? (*Please check **ONE** category*):
☐ **18 TO 25** ☐ **46 TO 65**
☐ **26 TO 35** ☐ **66 OR OLDER**
☐ **36 TO 45**
15. What is your annual total household income? (*Please check **ONE** category*):
☐ **LESS THAN \$10,000** ☐ **\$40,000 TO \$59,999**
☐ **\$10,000 TO \$24,999** ☐ **\$60,000 TO \$74,999**
☐ **\$25,000 TO \$39,999** ☐ **\$75,000 OR MORE**

Appendix 2. Product depiction sample



Appendix 3. Arizona Grown and Mexico Selected Quality Logos



Appendix 4. Consumer's Marginal Willingness to Pay Derivation

Consider a composite good Z with N attributes, $Z(z_1, z_2, \dots, z_N)$, where z_i refers to the quantity of the i^{th} attribute. Assuming that utility, $U[Z(z_1, \dots, z_N); X]$, is additively separable in Z and other goods, X , the marginal rates of substitution between any pair of attributes is independent of the level of any other goods, X . Now, let two attributes, z_i and z_j , be varied across alternative bundles Z^0 and Z^1 , while all other attributes are held constant, and let an individual compare bundles $Z^0(\dots z_i^0, z_j^0 \dots)$ and $Z^1(\dots z_i^1, z_j^1 \dots)$. When these two attributes are varied in proportions so that the individual is left indifferent between bundles Z^0 and Z^1 , the implied marginal rate of substitution between attributes z_i and z_j is the ratio of the marginal utilities $-U_{z_i}/U_{z_j}$ (Freeman).

If the composite good Z has a defined price or cost, P_Z , the utility function may be expressed in the indirect form $V[z_i, \dots, z_N, P_Z, I]$, where I represents the individual's income. Presented with a particular bundle of attributes, Z^0 , a consumer could be asked to provide a rating of the desirability of that bundle, r^0 . Utility may then be transformed by a transformation function $\phi\{\cdot\}$ such that:

$$(1) \quad r^0 = \phi\{V[z_i, \dots, z_N, P_Z, I]\}.$$

The transformation function is a monotonic function such that $v^0 > v^1 \Leftrightarrow r^0 > r^1$.

The transformation function is necessary, since the relative utility for different bundles is mapped to the bounded, integer rating scale (Roe, Boyle, and Teisl).

Assuming that the indirect utility function may be represented by a linear specification gives,

$$(2) \quad r = b_0 + b_1 z_1 + \dots + b_N z_N + b_P P_z + b_I I,$$

which is the traditional conjoint analysis equation. If the marginal utility of income is assumed constant, $b_P = -b_I$, the income term drops out upon estimation of this function, since an individual's income does not vary across alternative bundles of attributes (Hanemann). Suppose an individual compares bundles $Z^0(\dots z_i^0, \dots P_z^0)$ and $Z^1(\dots z_i^1, \dots P_z^1)$, with other attributes held constant. When z_i and P_z are varied so that the individual is indifferent between Z^0 and Z^1 , the ratio - V_{zi}/V_{zp} represents the marginal willingness to pay (implicit price) for attribute z_i (MacKenzie).

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